

MAR 15 2004

Express Mail Label No. EV 292457832US
 Date of Deposit: March 15, 2004
 Docket No. M0656.70055US00

FORM PTO-1449/A and B (Modified)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

APPLICATION NO.: 09/557,997

ATTY. DOCKET NO.: M0656.70055US00

FILING DATE: April 24, 2000

CONFIRMATION NO.: 7686

APPLICANT: Venkataraman et al.

GROUP ART UNIT: 1631

EXAMINER: Smith, Carolyn L.

Sheet 1 of 5

U.S. PATENT DOCUMENTS

Examiner's Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication or of issue of Cited Document MM-DD-YYYY
		Number	Kind Code		
CS	A46	4,551,296		Kavesh et al.	11-05-1985
	A47	4,679,555		Sackner	07-14-1987
	A48	4,830,013		Maxwell	05-16-1989
	A49	4,928,694		Maxwell	05-29-1990
	A50	5,453,171		Ma et al.	09-26-1995
	A51	5,569,366		Chen et al.	10-29-1996
	A52	5,607,859		Biemann et al.	03-04-1997
	A53	5,759,767		Lakowicz et al.	06-02-1998
	A54	5,767,269		Hirsh et al.	06-16-1998
	A55	5,776,434		Purewal et al.	07-07-1998
	A56	5,855,913		Hanes et al.	01-05-1999
	A57	5,874,064		Edwards et al.	02-23-1999
	A58	5,879,713		Roth et al.	03-09-1999
	A59	5,952,653		Covey et al.	09-14-1999
	A60	5,968,822		Pecker et al.	10-19-1999
	A61	5,985,309		Edwards et al.	11-16-1999
	A62	5,990,097		Kennedy	11-23-1999
	A63	5,993,846		Friedman et al.	11-30-1999
	A64	6,116,237		Schultz et al.	09-12-2000
	A65	6,136,295		Edwards et al.	10-24-2000
	A66	6,190,875	B1	Ben-Artzi et al.	02-20-2001
	A67	6,268,146	B1	Shultz et al.	07-31-2001
	A68	6,291,439	B1	Klock	09-18-2001
	A69	6,309,853	B1	Friedman et al.	10-30-2001
	A70	6,333,051	B1	Kabanov et al.	12-25-2001
	A71	6,597,996	B1	Venkataraman et al.	07-22-2003
	A72	RE37,053	E	Hanes et al.	02-13-2001

FOREIGN PATENT DOCUMENTS

Examiner's Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document (not necessary)	Date of Publication of Cited Document MM-DD-YYYY	Translation (Y/N)
		Office/ Country	Number	Kind Code			
CS	B11	EP	0 114 589	B1	President and Fellows of Harvard College	09-23-1987	
	B12	EP	0 140 781	A2	DROPIC Societe Civile de Gestion de Droit de Propriete Industrielle CHOAY	05-08-1985	Y- ABSTRACT ONLY
	B13	EP	0 244 236	A2	Novo Industri A/S	11-04-1987	
	B14	EP	0 342 215	B1	Genentech, Inc.	08-25-1993	

MAR 15 2004

FORM PTO-1449/A and B (Modified)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

APPLICATION NO.: 09/557,997

ATTY. DOCKET NO.: M0656.70055US00

FILING DATE: April 24, 2000

CONFIRMATION NO.: 7686

APPLICANT: Venkataraman et al.

GROUP ART UNIT: 1631

EXAMINER: Smith, Carolyn L.

Sheet 2 of 5

CS	B15	EP	0 394 971	A1	KabiVitrum AB	10-31-1990	
	B16	WO	00/12726	A2	Massachusetts Institute of Technology	03-09-2000	
	B17	WO	92/01003	A1	Board of Regents, The University of Texas System	01-23-1992	
	B18	WO	93/05167	A1	Children's Medical Center Corporation	03-18-1993	
	B19	WO	93/10450	A1	Glyko, Inc.	05-27-1993	
	B20	WO	93/15406	A1	Imperial College of Science, Technology & Medecine	08-05-1993	
	B21	WO	93/19734	A1	Baker Norton Pharmaceuticals, Inc.	10-14-1993	
	B22	WO	94/12618	A1	Massachusetts Institute of Technology	06-09-1994	
	B23	WO	95/13830	A1	Massachusetts Institute of Technology	05-26-1995	
	B24	WO	96/01648	A1	Ibex Technologies R and D, Inc.	01-25-1996	
	B25	WO	96/32149	A1	Inhale Therapeutic Systems	10-17-1996	
	B26	WO	97/06783	A1	Baker Norton Pharmaceuticals, Inc.	02-27-1997	
	B27	WO	97/11684	A1	Ibex Technologies Inc.	04-03-1997	
	B28	WO	97/35562	A1	Danbiosyst UK Limited	10-02-1997	
	B29	WO	98/04902	A1	The State of Oregon	02-05-1998	
	B30	WO	98/31346	A1	Massachusetts Institute of Technology	07-23-1998	

OTHER ART — NON PATENT LITERATURE DOCUMENTS

Examiner's Initials	Cite No	Include name of the author (in CAPITAL LETTERS) title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, relevant page(s), volume-issue number(s), publisher, city and/or country where published.	Translation (Y/N)
CS	C50	AMEER et al., "A New Approach to Regional Heparinization: Design and Development of a Novel Immobilized Heparinase Device", <i>Blood Purification Meeting Information: The International Conference on Continuous Renal Replacement Therapies</i> , 1998, 107-108, 16(2). ABSTRACT ONLY	
	C51	BERRY et al., "Distinct Heparan Sulfate Glycosaminoglycans are Responsible for Mediating Fibroblast Growth Factor-2 Biological Activity Through Different Fibroblast Growth Factor Receptors", <i>The FASEB Journal Online</i> , 2001, 1-19, Article #: 10.1096/fj.00-0661fje.	
	C52	CARLSON et al., "Behavior of Antithrombin III Isoforms on Immobilized Heparins", <i>The Journal of Biological Chemistry</i> , 1988, 2187-2194, 263(5).	
	C53	CLAVERIE et al., "Information Enhancement Methods for Large Scale Sequence Analysis", <i>Computers Chem.</i> , 1993, 191-201, 17(2).	
	C54	CRUM et al., "A New Class of Steroids Inhibits Angiogenesis in the Presence of Heparin or a Heparin Fragment", <i>Science</i> , 1985, 1375-1378, 230.	
	C55	DULL et al., "Lung Endothelial Heparan Sulfates Mediate Cationic Peptide-induced Barrier Dysfunction: a New Role for the Glycocalyx", <i>Am J Physiol Lung Cell Mol Physiol</i> , 2003, L986-L995, 285.	
	C56	EDWARDS et al., "Large Porous Particles for Pulmonary Drug Delivery", <i>Science Reprint Series</i> , 1997, 1868-1871, 276.	
	C57	EDWARDS et al., "Recent Advances in Pulmonary Drug Delivery Using Large, Porous Inhaled Particles", <i>J. Appl. Physiol.</i> , 1998, 379-385, 85(2).	
	C58	ERNST et al., "Expression in <i>Escherichia coli</i> , Purification and Characterization of Heparinase I from <i>Flavobacterium heparinum</i> ", <i>Biochem. J.</i> , 1996, 589-597, 315.	
	C59	ERNST et al., "Enzymatic Degradation of Glycosaminoglycans", <i>Critical Reviews in Biochemistry and Molecular Biology</i> , 1995, 387-444, 30(5).	
	C60	FOLKMAN et al., "Angiogenesis Inhibition and Tumor Regression Caused by Heparin or a Heparin Fragment in the Presence of Cortisone", <i>Science</i> , 1983, 719-725, 221.	

MAR 15 2004

FORM PTO-1449/A and B (Modified)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

APPLICATION NO.: 09/557,997

ATTY. DOCKET NO.: M0656.70055US00

FILING DATE: April 24, 2000

CONFIRMATION NO.: 7686

APPLICANT: Venkataraman et al.

GROUP ART UNIT: 1631

EXAMINER: Smith, Carolyn L.

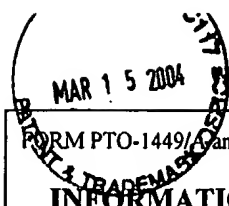
Sheet

3

of

5

C5	C61	GIOLDASSI et al., "Determination of Phosphorylated and Sulfated Linkage-Region Oligosaccharides in Chondroitin/ Dermatan and Heparan Sulfate Proteoglycans by High Performance Liquid Chromatography", <i>J. Liq. Chrom. & Rel. Technol.</i> , 1999, 1997-2007, 22(13).		
	C62	GODAVARTI et al., "Heparinase III from <i>Flavobacterium heparinum</i> : Cloning and Recombinant Expression in <i>Escherichia Coli</i> ", <i>Biochemical and Biophysical Research Communications</i> , 1996, 751-758, 225(3).		
	C63	GODAVARTI et al., "A Comparative Analysis of the Primary Sequences and Characteristics of Heparinases I, II, and III from <i>Flavobacterium heparinum</i> ", <i>Biochemical and Biophysical Research Communications</i> , 1996, 770-777, 229(3).		
	C64	GODAVARTI et al., "Heparinase I from <i>Flavobacterium heparinum</i> ", <i>The Journal of Biological Chemistry</i> , 1998, 248-255, 273(1).		
	C65	GUERRINI et al., "A Novel Computational Approach to Integrate NMR Spectroscopy and Capillary Electrophoresis for Structure Assignment of Heparin and Heparan Sulfate Oligosaccharides", <i>Glycobiology</i> , 2002, 713-719, 12(11).		
	C66	HARENBERG et al., "Anticoagulant Effects and Tissue Factor Pathway Inhibitor after Intrapulmonary Low-Molecular-Weight Heparin", <i>Blood Coagulation and Fibrinolysis</i> , 1996, 477-483, 7.		
	C67	HORNER, "Heterogeneity of Rat Skin Heparin Chains with High Affinity for Antithrombin", <i>Biochem. J.</i> , 1987, 693-698, 244.		
	C68	JOHNSON et al., "Endothelial Cells Preparing to Die by Apoptosis Initiate a Program of Transcriptome and Glycome Regulation", <i>The FASEB Journal</i> , 2004, 188-190, 18.		
	C69	KANABROCKI et al., "Heparin as a Therapy for Atherosclerosis: Preliminary Observations on the Intrapulmonary Administration of Low-Dose Heparin in the Morning Versus Evening Gauged by Its Effect on Blood Variables", <i>Chronobiology International</i> , 1991, 210-233, 8(3).		
	C70	KANABROCKI et al., "A Quest for the Relief of Atherosclerosis: Potential Role of Intrapulmonary Heparin - A Hypothesis", <i>Quarterly Journal of Medicine, New Series</i> , 1992, 259-282, 83(300).		
	C71	KEISER et al., "Direct Isolation and Sequencing of Specific Protein-Binding Glycosaminoglycans", <i>Nature Medicine</i> , 2001, 123-128, 7(1).		
	C72	KISHIBE et al., "Structural Requirements of Heparan Sulfate for the Binding to the Tumor-derived Adhesion Factor/ Angiomodulin That Induces Cord-like Structures to ECV-304 Human Carcinoma Cells", <i>The Journal of Biological Chemistry</i> , 2000, 15321-15329, 275(20).		
	C73	KRIETZ et al., "Controlled Delivery of Therapeutics from Microporous Membranes. II. <i>In vitro</i> Degradation and Release of Heparin-loaded Poly (D,L-lactide-co-glycolide)", <i>Biomaterials</i> , 1997, 1645-1651, 18(24).		
	C74	LIU, Dongfang, et al., "The Calcium-binding Sites of Heparinase I from <i>Flavobacterium heparinum</i> are Essential for Enzymatic Activity", <i>The Journal of Biological Chemistry</i> , 1999, 4089-4095, 274(7).		
	C75	LIU, Dongfang, et al., "Dynamic Regulation of Tumor Growth and Metastasis by Heparan Sulfate Glycosaminoglycans", <i>Seminars in Thrombosis and Hemostasis</i> , 2002, 67-78, 28(1).		
	C76	LIU, Dongfang, et al., "Tumor Cell Surface Heparan Sulfate as Cryptic Promoters or Inhibitors of Tumor Growth and Metastasis", <i>PNAS</i> , 2002, 568-573, 99(2).		
	C77	LIU, Jian, et al., "Strategy for the Sequence Analysis of Heparin", <i>Glycobiology</i> , 1995, 765-774, 5(8).		
	C78	LIU, Jian, et al., "Characterization of a Heparan Sulfate Octasaccharide That Binds to Herpes Simplex Virus Type 1 Glycoprotein D", <i>The Journal of Biological Chemistry</i> , 2002, 33456-33467, 277(36).		
	C79	LIU, Jian, et al., "Heparan Sulfate D-Glucosaminyl 3-O-Sulfotransferase -3A Sulfates N-Unsubstituted Glucosamine Residues", <i>The Journal of Biological Chemistry</i> , 1999, 38155- 38162, 274(53).		
	C80	MARCINIAK, "Differential Role of Fractionated Heparin in Antithrombin-III Proteolysis", <i>Blood</i> , 1982, 576-581, 59(3).		
	C81	McLEAN et al., "Enzymic Removal of 2-O-Sulphato- Δ_4 -Glycuronic Acid Residues From Heparin Oligosaccharides", <i>Proc. of the 7th Intl. Symposium of Glycoconjugates</i> , 1983, 68-69.		
	C82	MURPHY et al., "Basic Fibroblast Growth Factor Binding and Processing by Human Glioma Cells", <i>Molecular and Cellular Endocrinology</i> , 1995, 193-203, 114.		
	C83	MYETTE et al., "The Heparin / Heparan Sulfate 2-O-Sulfatase from <i>Flavobacterium heparinum</i> ", <i>The Journal of Biological Chemistry</i> , 2003, 12157-12166, 278(14).		



FORM PTO-1449/1 and B (Modified)		APPLICATION NO.: 09/557,997	ATTY. DOCKET NO.: M0656.70055US00
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		FILING DATE: April 24, 2000	CONFIRMATION NO.: 7686
		APPLICANT: Venkataraman et al.	
		GROUP ART UNIT: 1631	EXAMINER: Smith, Carolyn L.
Sheet	4	of	5

CS	C84	MYETTE et al., "Molecular Cloning of the Heparin / Heparan Sulfate Δ 4,5 Unsaturated Glycuronidase from <i>Flavobacterium heparinum</i> , its Recombinant Expression in <i>Escherichia coli</i> , and Biochemical Determination of its Unique Substrate Specificity", <i>Biochemistry</i> , 2002, 7424-7434, 41(23).		
	C85	MYETTE et al., "Expression in <i>Escherichia coli</i> , Purifications and Kinetic Characterization of Human Heparan Sulfate 3-O-Sulfotransferase-1", <i>Biochemical and Biophysical Research Communications</i> , 2002, 1206-1213, 290(4).		
	C86	NATKE et al., "Heparinase Treatment of Bovine Smooth Muscle Cells Inhibits Fibroblast Growth Factor-2 Binding to Fibroblast Growth Factor Receptor but Not FGF-2 Mediated Cellular Proliferation", <i>Angiogenesis</i> , 1999, 249-257, 3.		
	C87	NESHEIM et al., "Dependence of Antithrombin III and Thrombin Binding Stoichiometries and Catalytic Activity on the Molecular Weight of Affinity-purified Heparin", <i>The Journal of Biological Chemistry</i> , 1986, 3214-3221, 261(7).		
	C88	PADERA et al., "FGF-2/ Fibroblast Growth Factor Receptor/ Heparin-like Glycosaminoglycan Interactions: a Compensation Model for FGF-2 Signaling", <i>The FASEB Journal</i> , 1999, 1677-1687, 13(13).		
	C89	PIXLEY et al., "Preparation of Highly Stable Antithrombin-sepharose and Utilization for the Fractionation of Heparin", <i>Thrombosis Research</i> , 1982, 129-133, 26(2).		
	C90	POJASEK et al., "Histidine 295 and Histidine 510 are Crucial for the Enzymatic Degradation of Heparan Sulfate by Heparinase III", <i>Biochemistry</i> , 2000, 4012-1019, 39(14).		
	C91	POJASEK et al., "Biochemical Characterization of the Chondroitinase B Active Site", <i>The Journal of Biological Chemistry</i> , 2002, 31179-31186, 277(34).		
	C92	POJASEK et al., "Recombinant Expression, Purification, and Kinetic Characterization of Chondroitinase AC and Chondroitinase B from <i>Flavobacterium heparinum</i> ", <i>Biochemical and Biophysical Research Communications</i> , 2001, 343-351, 286(2).		
	C93	RAMAN et al., "Identification of Structural Motifs and Amino Acids within the Structure of Human Heparan Sulfate 3-O-Sulfotransferase that Mediate Enzymatic Function", <i>Biochemical and Biophysical Research Communications</i> , 2002, 1214-1219, 290(4).		
	C94	RAMAN et al., "The Heparin / Heparan Sulfate 2-O-Sulfatase from <i>Flavobacterium heparinum</i> ", 2003, 12167-12174, 278(14). <i>J. Biol. Chem.</i>		
	C95	RHOMBERG et al., "Mass Spectrometric and Capillary Electrophoretic Investigations of the Enzymatic Degradation of Heparin-like Glycosaminoglycans", <i>Proc. Natl. Acad. Sci. USA</i> , 1998, 4176-4181, 95.		
	C96	RHOMBERG et al., "Mass Spectrometric Evidence for the Enzymatic Mechanism of the Depolymerization of Heparin-like Glycosaminoglycans by Heparinase II", <i>Proc. Natl. Acad. Sci. USA</i> , 1998, 12232-12237, 95.		
	C97	SASISEKHARAN et al., "Roles of Heparan-sulfate Glycosaminoglycans in Cancer", <i>Nature Reviews</i> , 2002, 521-528, 2.		
	C98	SASISEKHARAN et al., "Heparin and Heparan Sulfate: Biosynthesis, Structure and Function", <i>Current Opinions in Biological Chemistry</i> , 2000, 626-631, 4(6).		
	C99	SHRIVER et al., "Biochemical Investigations and Mapping of the Calcium-binding Sites of Heparinase I from <i>Flavobacterium heparinum</i> ", <i>The Journal of Biological Chemistry</i> , 1999, 4082-4088, 274(7).		
	C100	SHRIVER et al., "Sequencing of 3-O Sulfate Containing Heparin Decasaccharides with a Partial Antithrombin III Binding Site", <i>PNAS</i> , 2000, 10359-10364, 97(19).		
	C101	SHRIVER et al., "Cleavage of the Antithrombin III Binding Site in Heparin by Heparinases and its Implication in the Generation of Low Molecular Weight Heparin", <i>PNAS</i> , 2000, 10365-10370, 97(19).		
	C102	SHRIVER et al., "Emerging Views of Heparan Sulfate Glycosaminoglycan Structure / Activity Relationships Modulating Dynamic Biological Functions", <i>TCM</i> , 2002, 71-77, 12(2).		
	C103	SUNDARAM et al., "Rational Design of Low-Molecular Weight Heparins with Improved <i>In vivo</i> Activity", <i>PNAS</i> , 2003, 651-656, 100(2).		
	C104	TAYLOR et al., "Protamine is an Inhibitor of Angiogenesis", <i>Nature</i> , 1982, 307-312, 297.		
	C105	WISHART et al., "A Single Mutation Converts a Novel Phosphotyrosine Binding Domain into a Dual-specificity Phosphatase", <i>The Journal of Biological Chemistry</i> , 1995, 26782-26785, 270(45).		
✓	C106	WITKOWSKI et al., "Conversion of a β -Ketoacyl Synthase to a Malonyl Decarboxylase by Replacement of the Active-Site Cysteine with Glutamine", <i>Biochemistry</i> , 1999, 11643-11650, 38(36).		

MAR 15 2004

FORM PTO-1449/A and B (Modified)

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

APPLICATION NO.: 09/557,997

ATTY. DOCKET NO.: M0656.70055US00

FILING DATE: April 24, 2000

CONFIRMATION NO.: 7686


APPLICANT: Venkataraman et al.

GROUP ART UNIT: 1631

EXAMINER: Smith, Carolyn L.

Sheet 5 of 5

CS	C107	YAMADA et al., "Structural Studies on the Bacterial Lyase-resistant Tetrasaccharides Derived from the Antithrombin III-binding Site of Porcine Intestinal Heparin", <i>The Journal of Biological Chemistry</i> , 1993, 4780-4787, 268(7).		
CS	C108	ZHANG et al., "6-O-Sulfotransferase-1 Represents a Critical Enzyme in the Anticoagulant Heparan Sulfate Biosynthetic Pathway", <i>The Journal of Biological Chemistry</i> , 2001, 42311-42321, 276(45).		

EXAMINER		DATE CONSIDERED	4/29/04
----------	---	-----------------	---------

#EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

*a copy of this reference is not provided as it was previously cited by or submitted to the office in a prior application, Serial No. __, filed __, and relied upon for an earlier filing date under 35 U.S.C. 120 (continuation, continuation-in-part, and divisional applications).

[NOTE - Must provide a copy of any patent, publication, other information listed, even if it was previously submitted to, or cited by, the U.S. Patent Office in an earlier application, unless the earlier application is identified by the IDS and is relied upon for an earlier filing date under 35 U.S.C. §120, and the copy was provided in the earlier application.]